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ABSTRACT

Ecological case study methods were used in four early childhood special education (ECSE) screening programs to identify factors influencing outcomes of screening. Observations, interviews, file searches, and parent surveys were used to obtain multidimensional descriptions of ECSE programs, including outreach, screening, and referral practices. Two outcomes of screening were used as benchmarks for comparing programs: the percentage of eligible preschoolers screened (participation rate); and the percentage of screened children referred for further developmental assessment (referral rate). Results indicated that screening and referral practices varied considerably among programs, although few practices consistently influenced screening outcomes. Participation rates were clearly related to school district size and the accessibility of screening to the public. Referral rates were most obviously influenced by screening purposes, second-level referral decisions, separate speech/language referral criteria, and subjective judgment. Relationships among community agencies influenced both participation and referral rates. Considerations and guidelines are presented for evaluation and improvement of ECSE screening programs. (Author)

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RESEARCH REPORT #11

POLICY ANALYSIS OF SCREENING AND REFERRAL FOR EARLY CHILDHOOD SPECIAL EDUCATION PROGRAMS

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EARLY CHILDHOOD ASSESSMENT PROJECT

September, 1986

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Abstract

Ecological case study methods were used in four early childhood special education (ECSE) screening programs to identify factors influencing important outcomes of screening. Observations, interviews, file searches, and parent surveys were used to obtain multidimensional descriptions of ECSE programs, including outreach, screening, and referral practices. Two outcomes of screening were used as benchmarks for comparing programs: (a) the percentage of eligible preschoolers screened (participation rate), and (b) the percentage of screened children referred for further developmental assessment (referral rate). Results indicated that screening and referral practices varied considerably among programs, although few practices consistently influenced screening outcomes. Participation rates were most clearly related to school district size and the accessibility of screening to the public. Referral rates were most obviously influenced by screening purposes, second-level referral decisions, separate speech/language referral criteria, and subjective judgment. Relationships among community agencies influenced both participation and referral rates. Considerations and guidelines are presented for evaluation and improvement of ECSE screening programs.

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Policy Analysis of Screening and Referral for Early Childhood Special Education Programs

James E. Ysseldyke, Martha L. Thurlow, Patrick J. O'Sullivan, Jill A. Weiss, Paula A. Nania, and Camilla A. Lehr

Since the Child Find Mandate of P.L. 94-142 directed states to locate, identify, and evaluate handicapped children in 1975, most states have implemented some form of preschool or early school screening program to facilitate the location and identification of handicapped preschoolers (Gracey, Azzara, & Rheinherz, 1984). Preschool screening functions as an initial sorting procedure that identifies children from the general population who may have special education needs, or be "at-risk" for psychoeducational problems. Screening is composed of three procedural components or stages: (a) outreach procedures aimed at notifying and gaining the participation of the populace, (b) screening procedures and test administration aimed at identifying at-risk children, and (c) deciding whether and where to refer children for further evaluation.

The increase in screening programs has been associated with increases in services for handicapped preschoolers. Forty-two states now mandate special education services to some portion of the preschool handicapped population (U.S. Department of Education, 1985). And, the incentive for states to serve all handicapped children aged 3 to 5 was strengthened by the Education of the Handicapped Amendments of 1986. In those amendments Congress established a new federal discretionary program to help states develop and implement a comprehensive, coordinated, interdisciplinary program of early intervention services for handicapped infants, toddlers, and their

families. Hence, it seems likely that preschool screening will continue to be the primary gateway to a growing number of early childhood special education services.

Despite the widespread interest and efforts in screening preschoolers, a variety of concerns about screening have been raised. These include the appropriateness of at-risk models (Keogh & Daley, 1983), the need to clarify screening purposes (Gracey et al., 1984), and the accuracy of screening instruments (Lichtenstein & Ireton, 1984). In addition, studying the effects of screening services has been complicated by the seemingly haphazard grouping of federal and state services offered to handicapped and at-risk preschoolers and their families (Smith, 1986). Perhaps these considerations and complications have contributed to the limited research addressing factors that may influence the outcomes of screening. In fact, determining how the many potential social, economic, and educational influences on screening actually affect screening outcomes has proven to be difficult (Ysseldyke & O'Sullivan, in press). For example, a study of screening programs with extremely high or low referral rates revealed no clear-cut variables related to the extreme variability in referral rates (Ysseldyke, Thurlow, Weiss, Lehr, & Bursaw, 1985). In different programs, different factors embedded in the context of unique community characteristics seemed to influence whether high or low percentages of screened children were referred for further evaluation. Thus, we are still faced with such fundamental questions as, "What actually happens during screening?" and "How does what

happens during screening influence screening outcomes?" Use of a research method capable of capturing relationships among many interacting variables appears necessary to answer these questions.

In an effort to understand how many social, political, economic, and educational factors influence preschool screening, we studied several screening programs in depth, using an ecological case study approach. Quantitative and qualitative data were gathered in four screening programs from many sources using a variety of methods to obtain a rich multidimensional picture of each preschool screening program. Current practices used in each program during outreach, screening, and referral procedures were identified. Then, the practices were analyzed using two outcomes of screening as benchmarks for comparing programs: (a) the percentage of eligible preschoolers screened in each program (participation rate), and (b) the percentage of screened children referred for special education assessment (developmental referral rate). The degree of community participation in screening, and screening referral rates are clearly important factors that influence whether handicapped preschoolers are identified during screening. These benchmark variables were used to address three research questions:

1. What factors influence participation in preschool screening programs?
2. Do factors related to screening procedures (e.g., setting, personnel, tests) influence referral rates?
3. Do screening referral criteria and practices influence screening referral rates?

Findings related to these questions were integrated to produce a set of considerations and guidelines for policy makers and

practitioners. The considerations and guidelines also set a framework for evaluating the impact of specific factors on the identification of handicapped preschoolers in local school districts.

Method

Subjects

Four school districts in Minnesota were subjects in this investigation. Within these districts, the focus was on the early childhood special education program (ECSE) and the preschool screening program. Many individuals within and outside these programs provided information for the study. The general characteristics of the four programs are described here using fictitious community names to help readers follow the discussion.

Oakwood is a rural community of approximately 6,000 residents. About 94% of the families in the district are above the poverty level (Bureau of the Census, 1982). The school district enrolls approximately 1,500 pupils in pre-kindergarten through grade 12 programs each year, about 2% of whom are minorities. In the most recent academic year, 1985-86, there were 14 children enrolled in the Oakwood ECSE program.

Elmwood is a suburban school district that serves primarily a middle to upper-middle class population, with almost 50% of the families earning an income above $30,000 (Bureau of the Census, 1982). The school district serves approximately 7,000 students in pre-kindergarten through grade 12 classes each year; only 2% of whom are minorities. Each year, the Elmwood ECSE program serves approximately 30 children.

Birchwood is a suburban school district that encompasses six communities. The total district population is approximately 33,763, with 99% of its families above the poverty level (Metropolitan Council, 1985). The school district enrolls approximately 8,400 pupils in pre-kindergarten through grade 12 programs each year. In the 1985-86 academic year, 42 children were enrolled in the Birchwood ECSE program, which includes two components serving handicapped preschoolers.

Maplewood is a large urban school district serving more than 35,000 pupils from pre-kindergarten to grade 12. Compared to other districts in Minnesota, Maplewood falls at the 42nd percentile for median family income, and the 12th percentile in median age of residents (Bureau of the Census, 1982). About 38% of the residents belong to minority groups, and 45% of special education preschoolers are minorities (School District Information, 1985).[1] Within the early childhood special education program, School 1 serves an average of about 200 handicapped 4-year-old children in 13 classrooms during the school year. These children attend half-day sessions five days per week for up to nine months. About 90% of all handicapped preschoolers attend School 1, and the remaining severely handicapped preschoolers attend School 2 (physical handicaps), School 3 (hearing-impaired), and School 4 (autism).

Preschool Screening (PSS) Program

Except where otherwise noted, the term "screening" refers to the procedures associated with the PSS program. The four districts in

this study participated in the statewide PSS program administered by the state education department. The purpose of PSS, according to state statute, is to assist parents and communities with improving the health of children, and planning educational and health programs. Many districts also use PSS to meet the child find mandate of federal law requiring that handicapped preschoolers be identified. The PSS program is governed by state law and rules requiring all school districts to offer health and developmental screening to all children at least once before kindergarten entry. Districts are required to offer six screening components: vision, hearing, growth (height/weight), health history, and developmental screening, and a summary interview with parents. Development is screened in four areas, including speech/language, cognitive, gross and fine motor, and social-emotional development. PSS is voluntary for parents and not required for school enrollment. Districts are reimbursed for screening costs, up to a maximum of $15.60 per child for fiscal year 1985.

One or more optional components, in addition to the six mandated screening components, were offered by three of the four programs studied. Oakwood offered a dental inspection to all children screened. Birchwood provided nutrition screening as part of the health history component. Maplewood offered four optional components to children eligible for medical assistance: dental, nutrition, physical inspection, and laboratory tests (urinalysis, blood tests).

Procedure

The four sites were selected to reflect a range in demographic characteristics (including community characteristics, and size of program) and in approaches to diagnostic assessment. Also, because data collection procedures required extensive contact with the sites, proximity to the research center was considered in this selection process. All sites contacted agreed to participate in the research.

One research team member was assigned to each participating district and acted as primary contact person and data collector. Typically, more than one person collected data in each site. In three of the districts, data collection took place during an eight-month period. Due to time and travel restrictions, all data from the rural site (Oakwood) were collected during a three-month period in the spring.

Data collection procedures included: (a) observations of meetings, classroom activities, and screening and assessment procedures, (b) extensive interviews with various staff and administrative personnel, (c) file searches, and (d) parent surveys. Although specific data collection procedures varied as a function of differences in the programs, the same research questions were asked in all sites. Detailed information describing preschool screening, diagnostic assessment, the instructional programs, program exit procedures, and follow-up data on student participants was gathered for each site (see Ysseldyke, Thurlow, Lehr, Nania, O'Sullivan, Weiss, & Bursaw, 1986, for the full descriptive reports.)

Results and Discussion

What Factors Influence Participation?

Table 1 is a summary of the percentage of eligible children screened (participation rate), number of children screened, principal outreach methods used by programs, and the time of year and number of days screening was offered.[2] Participation rates were similar for Elmwood and Maplewood programs, slightly lower for Birchwood, and markedly higher for Oakwood. The relatively high participation rate in Oakwood was also above average rates observed statewide, which have varied between 78% to 84% over the past five years (Minnesota Department of Education [MDE], 1985). The high participation rate was, however, in general agreement with state education department observations that most districts, and particularly smaller-sized districts, screen over 90% of eligible preschoolers (MDE, 1985). Thus, district size, which is related to the number of children screened, appeared to be an important influence on participation rates.

Although participation rates for the four programs varied considerably, outreach methods used to notify the public about screening were similar. Three of the programs relied on census data to obtain lists of residents. The residents were contacted by letter in all three districts. In two of these programs (Elmwood, Birchwood), eligible families also were contacted by telephone. All programs used a variety of additional outreach methods including notices in newspapers, newsletters, and flyers. However, outreach methods were not clearly related to participation rates.

Table 1

Percentage of Eligible Children Screened (Participation Rate), Number of Children Screened, Principal Outreach Methods, Time of Year, and Number of Days Screening Was Offered

	Programs			
	Oakwood	Elmwood	Birchwood	Maplewood
Participation Rate	88%[a]	66%	54%	61%[a]
Number of Children Screened	125	358	597	2,171
Primary Outreach Methods	Letter (Census) Newspaper	Letter Telephone (Census) Newsletters	Letter Telephone (Census) Newspaper	Day Cares, Flyers, Media
Time of Year	April or May	Sept.-Nov. March-May	Feb., March	Sept.-May
Number of Days Offered	5	50	11	160

[a]Estimated (see Footnote 2)

There was moderate evidence that participation rates were influenced by screening schedules and accessibility of screening to the public. All programs screened children in the spring. Elmwood also offered screening in the fall, and Maplewood offered screening throughout most of the school year. Although Elmwood and Birchwood programs screened similar numbers of children, Elmwood offered screening on many more days, which may have contributed to the higher participation rate in Elmwood. Also, Maplewood was the only program to offer screening at multiple community sites. This use of multiple screening sites in Maplewood undoubtedly made screening more accessible for some Maplewood residents. In addition, by screening in Maplewood day cares, many children of parents who worked or attended school were screened without parents taking time off from their other commitments. These factors probably helped to increase the Maplewood participation rate. Unfortunately, it is not possible to determine whether participation rates were increased by these factors, because Maplewood also used outreach procedures that differed somewhat from other communities. Nonetheless, a moderate degree of evidence suggested that factors related to screening accessibility contributed to variability in participation rates.

To summarize, most screening programs used similar methods to notify the public about screening, although participation rates varied widely. For larger suburban and urban communities, participation rates ranged from about 50% to 65% of eligible children, regardless of the outreach method used. Although there are not established

guidelines for participation rates, most screeners and screening coordinators said they wished that their participation rates were higher. There was some evidence that the accessibility of screening programs contributed to increased participation rates. Perhaps parents view a limited screening schedule as being inconvenient, too restrictive in relation to their schedules, or they may simply forget when screening is offered. Clearer evidence existed to indicate that school district size was a critical factor, one that limited the effectiveness of typical outreach efforts to smaller-sized communities. Thus, reliance on census data to notify the public led to a high participation rate only for the smallest screening program. The lower rates of family mobility and close community ties typically found in rural areas may have contributed to the higher participation rate in the rural program.

Another possible influence on participation rates, related to screening at multiple sites, involved relationships with community agencies. Thus, Maplewood relied primarily on contacts with day centers to reach families with eligible children, and obtained a participation rate comparable to other programs, which used census data to locate eligible children. Apparently, collaboration with agencies already serving a portion of the preschool population can lead to increased participation in screening. In addition, the program with the lowest participation rate did not formally notify community agencies about screening.

Do Screening Procedures Influence Referral Rates?

Time and setting. Factors related to the time and setting of screening, and referral rates are presented in Table 2. Developmental referral rates for Elmwood and Maplewood were consistent with the statewide average of 11% to 12% (MDE, 1985). However, referral rates for Oakwood and Birchwood programs were markedly below the state average. It should be noted that the Birchwood referral rate did not include referrals for assessment of speech/language concerns only, and consequently should be considered an underestimate of the overall referral rate for the program.

Variation in screening sites was not related to referral rates in any obvious way. Oakwood, Elmwood, and Birchwood programs conducted screening in the school gym or cafeteria. In Birchwood, vision and hearing screening were conducted in adjacent band rooms, and children were registered in the main hallway outside the gym. In Maplewood, screening was conducted at about 80 different sites, including 40 city recreation centers, and about 40 day care settings. The facilities and quality of the atmosphere varied considerably among the various settings in Maplewood. Sometimes physical inspections were complicated by frigid temperatures or hearing screening by a noisy environment. Moreover, in all programs the screening environment sometimes presented distractions that interfered with screening procedures, especially during busier time periods.

The average time used to screen each child varied between 30 minutes for the Elmwood and Maplewood programs, to 120 minutes at

Table 2

Description of Screening Setting, Average Time to Complete Screening, and Participation and Referral Rates

	Programs			
Time/Place Factors	Oakwood	Elmwood	Birchwood	Maplewood
Developmental Referral Rate	1% - 3%	11%	5%	11%
Where Conducted	Gym	Cafeteria	Gym Band Rooms Hallway	Varies
Average Screening Time	90 minutes	30 minutes	120 minutes	30 minutes

Birchwood. Much of the variance in screening time was due to differences in time spent talking with parents in the summary interviews, and to a lesser extent in time for parent completion of forms. For example, parents in Birchwood were asked to complete a 50-item communication abilities questionnaire, and to provide nutrition information on the health history form, which increased screening time. Developmental referral rates tended to be higher in programs with shorter average screening times. But there is little logical or empirical basis for this inverse relationship between average screening times and referral rates. The apparent relationship, in fact, may be coincidental. Influences on referral rates that are more obvious and compelling are presented below.

Personnel. Table 3 is a summary of developmental referral rates, screening personnel, personnel who conducted summary interviews, and referral decision makers for the four programs. Two of the programs (Elmwood, Birchwood) relied heavily on volunteers to carry out screening procedures, and nurses to summarize results to parents. In these programs, children were referred to multidisciplinary teams. In Maplewood, two nurses conducted all screening components, including the summary interview with parents. In Oakwood, six different types of professionals conducted screening, and the Early Childhood (EC) Coordinator summarized results and made referrals. The developmental component at Oakwood was administered in sections by the EC teacher, a nurse, and speech/language pathologist. A dental hygenist carried out the dental component, and technicians were contracted through the

Table 3

Screening Personnel, Decision Makers, Participation and Developmental Referral Rates

	Programs			
	Oakwood	Elmwood	Birchwood	Maplewood
Developmental Referral Rate	1% - 3%	11%	5%	11%
Screening Personnel	EC Teacher Speech Clinician Nurse, Dental Hygenist, 2 County Techs.	15-20 Volunteers	15 Volunteers Several Nurses	2 Nurses
Summary Interviewers	EC Coordinator	2 Nurses	2 Nurses	2 Nurses
Referral Decision Makers	EC Coordinator	Multidisci-plinary Team	Multidisci-plinary Team	2 Nurses

County to perform hearing and vision screening. Interestingly, this program was the smallest screening program, but employed the highest number of different personnel. The largest program (Maplewood) employed the fewest different personnel. There was no apparent relationship between the types or numbers of personnel involved in screening and developmental referral rates.

Screening tests and procedures. Table 4 is a summary of information about screening tests and procedures in relation to referral rates. Elmwood and Maplewood used a single screener to administer all screening components to each child. Oakwood and Birchwood used a station administration approach -- children moved from one station to the next with each screening component being administered by different screening personnel. These differences in administration correspond to the recommended administration procedures associated with the developmental screening tools. These latter two programs used the DIAL (Mardell & Goldenberg, 1975) or its revised version, DIAL-R (Mardell-Czudnowski & Goldenberg, 1983), which were standardized using a station approach. In contrast, the DDST (Frankenburg & Dodds, 1967) used in Elmwood and the local screening tool (LST) used in Maplewood were standardized by having one screener administer the entire test. The DIAL, DIAL-R, and DDST are widely used screening instruments. Only the LST used in Maplewood was standardized and normed on the local population. The technical adequacy of popular screening instruments has been addressed previously (Lehr, Ysseldyke, & Thurlow, 1986; Thurlow, O'Sullivan, & Ysseldyke, 1986).

Table 4

Screening Tools, Procedures, and Developmental Referral Rates

	Programs			
	Oakwood	Elmwood	Birchwood	Maplewood
Developmental Referral	1% - 3%	11%	5%	11%
Administration Procedure	Station	1 Screener/Child	Station	1 Screener/Child
Developmental Tool	DIAL[b]	DDST[a]	DIAL-R[b]	Local Tool (LST)
Rescreening	Re-DIAL (except speech)	Vision, Hearing	Vision, Hearing	Hearing

[a]DDST: Denver Developmental Screening Test

[b]DIAL and DIAL-R: Developmental Indicators for the Assessment of Learning, and revised version

Oakwood and Birchwood programs, which used the station approach of the DIAL or DIAL-R, had lower referral rates than the other programs. However, it appears likely that this relationship between screening instruments and referral rates was due to differences in the referral process of programs (see below). Referral criteria for popular screening tests have been selected by test authors to yield roughly comparable referral rates. In fact, similar referral rates for diffeent popular screening tests have been reported in the literature (e.g., Lichtenstein, 1981).

Rescreening practices reduced referral rates. Three of the programs routinely rescreened children who failed hearing screening, and two of them also rescreened vision failures. The other program (Oakwood) rescreened children who failed the Conceptual and Motor areas of the DIAL. Children who failed the Language area of the DIAL were referred for in-depth speech/language assessment at Oakwood. It is noteworthy that the only program that rescreened in the developmental area had the lowest developmental referral rate.

In summary, screening time, setting, personnel, procedures and instruments varied widely among the four programs. Average screening times ranged from 30 to 120 minutes depending on the length of summary interviews, and the length and number of forms parents completed. In all programs screening was sometimes complicated by setting conditions, such as a noisy environment. Some programs used volunteers to conduct screening, other programs employed professionals. From one to six screeners administered screening

procedures, and each program used a different screening instrument. Only one program rescreened children in the developmental area, although rescreening in vision and hearing areas was more common. Percentages of eligible children referred for further evaluation did not appear to be affected by the screening setting or personnel used by different programs. The length of screening procedures and screening tests appeared to be related to referral rates. However, this relationship seemed to be a spurious one, not supported by expectations based on logic or previous research. In addition, more obvious influences upon referral rates are presented below. Rescreening of children who failed the developmental screening component was one factor that appeared to influence developmental referral rates -- the referral rate was lower when two consecutive screening failures were required for a referral.

Do Referral Criteria Influence Screening Outcomes?

Developmental referral rates, developmental referral agents, and speech referral criteria and agents for each program are shown in Table 5. All programs used age-normed cut-off scores from screening tests as developmental referral criteria. However, Maplewood used criteria based on total developmental scores, and Oakwood and Elmwood programs relied on subtest or subarea cut-off scores. The Birchwood criterion emphasized the DIAL-R total score, although subarea scores also were considered in a subjective manner. Thus, even when screening tools were highly similar (i.e., DIAL and DIAL-R), referral criteria were not the same. Intuitively, one might expect referral

Table 5

Developmental and Speech/Language Referral Criteria, Referral Agents, and Referral Rates

	Programs			
	Oakwood	Elmwood	Birchwood	Maplewood
Developmental Referral Rate	1% - 3%	11%	5%	11%
Developmental Referral Criteria	Fail All 3 DIAL Areas (excluding Communication)	Fail 2/3 DDST Areas	Fail or Within 5 points of DIAL-R	Below LST Total Score Cut-Off
Speech/Language Referral Criterion	Fail DIAL Communication Area	Meet Develop. Criterion + Fail Speech Worksheet	Fail DIAL-R Language Area	Below LST Cut-Off + Screener Judgment
Developmental Referral Agent	Program Assessment	Multidisci-plinary Team	Multidisci-plinary Team	Program Assessment
Speech/Language Referral Agent	Speech/ Language Assessment	Program Assessment or Screening	Speech/Language Assessment	Program Assessment

rates to be related to the leniency (or stringency) of referral criteria. However, comparison of referral criteria was complicated by the use of different scores or a combination of scores by each program in formulating their criterion. Despite this variability in criteria, referral rates were not related in any obvious way to whether programs used total scores versus subarea scores as referral criteria.

All programs used separate referral criteria for speech/language assessment. In some programs speech/language referral criteria were applied in addition to developmental criteria, and in other programs speech/language criteria were applied separately from developmental criteria. In Maplewood, speech/language referral criteria were the same as developmental criteria (i.e., below the LST cut-off), with the additional criterion of low ratings in speech as judged by screening nurses. All children referred for speech/language assessment in Maplewood also participated in the ECSE classroom assessment. This was not the case at other programs. The Oakwood and Birchwood programs used failure on the Language subarea (DIAL-R) or Communication subarea (DIAL) as referral criteria for speech/language assessment. Children failing these subareas typically were assessed by the speech/language clinician. These children were not considered for the ECSE program, unless they also met the developmental referral criterion. In Elmwood, the speech/language referral criterion was the same as the developmental referral criterion (i.e., failure on 2/3 DDST areas), but also included failure on the speech worksheet administered during screening. Speech/language referrals in Elmwood

were handled in a manner similar to developmental referrals, where a multidisciplinary team decided whether speech/language screening or assessment was appropriate.

Thus, for two programs, speech/language referral criteria were relatively stringent compared to developmental criteria -- referrals in the speech/language area required failure using a speech/language and developmental criterion. For the remaining programs, speech/language criteria were independent of developmental criteria and relatively lenient. Hence, a speech/language referral required failure in one screening test subarea, whereas developmental referrals required failure in multiple subareas or on a composite test score. Unfortunately, referral rates in the speech/language area were not available for analyzing the effects of separate speech/language criteria. However, it appears likely that use of separate and relatively lenient or strict referral criteria in the speech/language area should lead to differences between speech/language referral rates and referral rates in other developmental areas. In fact, statewide referral rates in the speech/language area consistently have exceeded referral rates in other developmental areas (MDE, 1985).

Do Referral Practices Influence Screening Outcomes?

Developmental referral agents and practices varied considerably. In Oakwood and Maplewood the referral agent was the Early Childhood Special Education (ECSE) assessment classroom. In Elmwood the referral agent was a multidisciplinary team, the members of which decided whether children should be briefly assessed or assessed in

depth by the ECSE team based on DDST subarea scores, information gathered in a home visit by the social worker, and any other available information. Elmwood children who met developmental referral criteria were assessed in the ECSE diagnostic classroom, or briefly "screened" in some developmental areas,[3] or both screened and assessed in different areas, or both screened and assessed in the same area (if the screener recommended further assessment). Birchwood also used a multidisciplinary team to decide what to do with children who failed PSS screening, or scored within five points of the failure criterion. In Birchwood, the PSS coordinator selected files to present at multidisciplinary team meetings in March, based on DIAL-R total and subarea scores, parent concerns, and observations by screeners. The Birchwood multidisciplinary team decided whether to refer children for a full ECSE classroom assessment, speech/language assessment alone, or no assessment. In 1986, 47 out of 597 screened children (8%) were selected by the Birchwood screening coordinator for discussion at the team meetings. The team recommended in-depth diagnostic assessment for 27 of the 47 children (5% of all children screened). PSS screeners and parents did not attend these initial team meetings in Elmwood and Birchwood.

Lower referral rates were associated with programs using a second-level referral criterion, such as the judgment of a multidisciplinary team (e.g., Birchwood) or failure on a rescreening (Oakwood). It is not surprising that introduction of a second criterion, or second "hurdle" could lead to lower referral rates.

Elmwood also used judgment of a multidisciplinary team, which reduced the number of children who were assessed in-depth by the ECSE team. However, all children referred to the Elmwood team were at least assessed briefly (i.e., "screened") in some developmental area.

What Other Factors Influenced Referral Rates?

In all programs, subjective data based on screener observations and parent reports also were considered in making referral decisions. In general, it was difficult to specify to what extent this subjective information and clinical judgment influenced screening referral decisions. However, the child's age, and parental and screener judgment were critical factors influencing referral decisions for questionable cases in all programs. In Maplewood for example, children close to kindergarten age were not referred for ECSE assessment, because they were too old for the Maplewood ECSE program. Instead, parents were told by screeners to inform the child's school for the next year about screening failures. In the other programs, younger children were more likely not to be referred for further assessment. Thus, in Oakwood, Elmwood, and Birchwood, the decision to assess children around 3½-years-old was more likely to be postponed, especially if the parent or referral decision maker felt the child might need more time to mature. In such cases, younger children could be rescreened the following year.

The purpose of screening, as it was implicitly applied in each program, appeared to be another important influence on referral rates. Recall that the purpose of the statewide PSS program was defined

broadly, and did not specifically emphasize locating and identifying handicapped children. However, most programs relied on the PSS program for identifying most children who were later more fully assessed and identified as handicapped. The Oakwood program was an exception. In Oakwood, most handicapped children had been referred from a local Developmental Achievement Center (DAC) where they had been identified and served at an earlier age. As a result, these children in the DAC did not participate in the PSS program, and instead were directly referred for ECSE program assessment by DAC personnel. Thus, DAC eligibility procedures were the principal method of identifying potentially handicapped children in Oakwood. And the Oakwood screening referral rate was reduced markedly, because few children considered for the ECSE program participated in preschool screening.

In summary, four factors appeared to account for most of the variation in referral rates. One involved the purpose of screening, as evidenced by the degree to which programs relied on screening referrals for identifying potentially handicapped children. In the program with the lowest referral rate, children referred from DACs, not screening, were admitted most frequently to the ECSE program. In this program children in DACs were identified as being at-risk at an earlier age, and often continued to receive services in the ECSE program after terminating the DAC program. Apparently, these children were preselected or "pre-screened," and did not participate in the PSS program. This example points out again the influence that relationships with community agencies can have on screening outcomes.

Another factor contributing to variation in referral rates was whether programs used some kind of second-level screening or decision process to reduce the number of children referred for assessment. Second-level decision making took a number of forms. In one program children were rescreened in the developmental area, and in several programs children who failed screening were referred to multidisciplinary teams for further deliberation. In each of these cases, the number of children participating in the program's in-depth assessment procedures was reduced by second-level screening or decision-making practices, which introduces an intermediate decision/assessment stage between "screening" and "assessment." The efficacy of second-level screening has some support in the literature (e.g., Teska & Stoneburner, 1980), although the appropriateness of specific procedures used in specific programs needs to be evaluated.

Third, use of separate referral criteria and procedures in the speech/language area may have influenced the number of children referred for further assessment. Although referral rate data in the speech/language area were not available for all programs, the available data and impressions of school personnel support the notion that separate speech/language criteria are sometimes relatively lenient, or more dependent on clinician judgment. Consequently, a higher proportion of children may be referred because of speech/language concerns compared to other developmental areas, which is a finding observed in statewide PSS referral rates (MDE, 1985).

Finally, subjective judgments of screeners, referral decision makers, and parents influenced screening referrals, particularly in

questionable pass/fail cases, and as a function of the child's age. Although all programs screened children between 3½- and 5-years-old, different programs tended to focus on detecting potential problems of children at either end of the age range. Most programs were less concerned about younger children in the "borderline" pass/fail region, reasoning that the children may need more time to mature and could be rescreened the following year. However, one program tended to be less concerned in similar cases with older children, because the ECSE program excluded older children. These older children could be assessed upon kindergarten entry. But in all programs and across all ages screened, the subjective impressions of parents and judgments of screeners were more likely to influence referral decisions in borderline pass/fail cases. In general, the influence of subjective information varied among programs and among those involved in each program.

Considerations and Guidelines

Factors identified in this study as important influences on screening outcomes deserve particular attention because, for the most part, they have been ignored in the literature. And, factors that influence screening outcomes require more thoughtful consideration by researchers and practitioners, because screening has become widespread and affects so many children. Furthermore, screening is typically the first contact between families and the educational system, and the only contact where the general populace is scrutinized for possible special education assessment. Thus, screening outcomes and their

influences have broad-based implications that need to be the focus of more intensive analysis. Findings of the present study using in-depth case study methods suggest that similar approaches may be applied successfully in other school districts.

Screening and referral practices varied considerably among programs, although few practices appeared to have consistent effects on screening outcomes. In each program the different practices seemed justifiable in the local context, and the impact of practices was dependent on the local context. Across all programs, screening participation rates were most obviously influenced by school district size, and the accessibility of screening to the public. Screening referral rates appeared to be influenced by the purpose of screening, use of second-level decision making, separate speech/language referral criteria, and subjective judgment. Both participation and referral rates were influenced by relationships with community agencies. These findings are encouraging given that previous research has had difficulty identifying influences on screening outcomes (e.g., Ysseldyke & O'Sullivan, in press).

Even though screening and referral practice variability was remarkable, there are reasons to believe that practices in other states may be more variable. Consider that the school districts studied participated in a longstanding state-administered screening program that specified the general purposes of screening, age range of children screened, the type and number of health and developmental areas to be screened, and specific screening procedures in some

screening areas (particularly health-related areas). Also, annual training workshops for screeners were conducted by the state health department. It seems likely, then, that screening and referral practices could be more variable in other states, and that the increased variability would be associated with even more potential influences on the outcomes of screening. Thus, factors that did not appear to influence screening outcomes in this study (e.g., outreach methods, screening personnel, screening tests), and factors not germane to this study (e.g., screening domains) may indeed influence the impact of screening in other locales. Such factors should not be considered as inconsequential contributors to the screening outcomes in general.

The following guidelines are presented to researchers and practitioners interested in evaluating and improving screening programs. These guidelines are not meant to be exhaustive. Rather, they highlight some of the considerations and initial steps needed to provide data that can lead to more appropriate policy decisions regarding preschool screening. Alternative approaches to evaluating ECSE programs have been discussed by Sheehan and Keogh (1982).

1. Define intended screening procedures, purposes, and goals.

Screening procedures, purposes, and goals need to be specified for outreach practices, screening practices, and referral practices. These definitional issues can be discussed within screening programs, and with representatives from other agencies providing service to preschoolers. The general intent of discussion among agencies is to

reduce gaps and duplications in service and facilitate efficient, comprehensive service delivery. For example, in many communities the state PSS program is not suited to be the sole means of identifying potentially handicapped children, because many children are never screened by PSS programs. Consequently, districts can try to maximize participation in PSS, perhaps by experimenting with different ways to make screening more accessible to the public, but also can take advantage of other screening and referral networks in the community.

Goals of screening should take into account the limited ability of screening to accurately identify needful children. Because of limits on the percentage of correct screening referral decisions (Gallagher & Bradley, 1972; Lichtenstein & Ireton, 1984), additional steps are necessary to "right" the wrong decisions. Screening children on more than one occasion using data from multiple sources has been recommended as one way to increase screening accuracy (Gracey et al., 1984). Also, important considerations about the relation between referral criteria and correct and incorrect screening decisions have been provided by Lichtenstein and Ireton (1984). The important thing to remember is that errors are introduced primarily by the limited measurement accuracy of screening tools, the inappropriate use of screening data and application of decision criteria, and the rapid developmental changes that young children undergo. These sources of error have to be taken into account to attain appropriate screening goals.

2. Describe and assess actual practices and outcomes as fully as possible.

Determining who does what to whom with what kinds of outcomes is an important step in describing the existing context of service delivery, so that evaluation and possible modification of practices can occur. It may be helpful to draw flow charts depicting the relationships among service providers and the paths children follow through screening, diagnostic assessment, treatment, and program exit procedures. In addition to providing a program description, such efforts should help identify gaps in knowledge and needs for data collection. The characteristics and numbers of children eligible for screening, screened, not screened, referred for assessment, not referred for assessment, assessed, not assessed, and so on, are critical outcome variables needed to evaluate the appropriateness and accuracy of screening programs.

Data collection also can focus on influences upon screening participation and referral rates identified above. And where various agencies use different screening and referral practices, careful attention should be paid to definitional issues, such as what is "screening" or a "screening referral?" Qualitative data, such as the comments and reactions of parents, should also be collected to encourage consideration of a broad range of potentially relevant factors. Practices should be described fully enough so that their consistency can be assessed across programs, screeners, and children. And because the field is changing rapidly, data need to be collected continuously over relatively long time periods. Although this

suggested record keeping may seem like extra work, much of the information is already gathered in many districts. What is needed is a more systematic and internally consistent means of identifying, organizing, and sharing important information for guiding policy decisions.

3. Evaluate actual screening practices and outcomes in relation to intended procedures, purposes, and goals.

Often, screening outcomes can be readily compared to objectively-defined screening goals and purposes. When screening purposes and goals are ill-defined or weakly related to each other, problems with interpreting screening outcomes data will be apparent. Thus, the ease of interpreting and evaluating screening outcomes is often a yardstick for how successful the preceding definitional and descriptive steps have been.

More often than not, outcome data will suggest new questions that need addressing, and data to be collected. Rather than being an endpoint, this evaluation phase should lead to recycling the evaluation process back to consideration of policy goals and purposes. Results may suggest that changes in screening practices are needed to meet intended goals. At other times, results may suggest that policy changes in purposes and goals are needed. In this case, informing local, state, and federal policy makers about obstacles to desired program objectives may be appropriate.

In conclusion, many issues confront the complex array of service providers trying to meet the needs of children. Because federal,

state, county, and local agencies provide services to young children and their families, considerable effort directed toward planning and evaluating coordinated, comprehensive interagency service delivery will be necessary. Smith (1986) outlined three workable approaches to planning coordinated interagency services among programs serving young children. The guidelines presented above may help those interested in evaluating and improving screening services for young children. If similar evaluation techniques can be applied to diagnostic assessment, treatment, and program exit procedures, policy makers could incorporate a more solid informational basis for policy decisions. A foundation of knowledge, including data that describe outcomes for programs and children, appears necessary to guide the many challenging decisions awaiting this rapidly changing field.

Footnotes

[1]School district information sources included special education program handbook (1984, a school district annual report [1985] and student statistical report [1985], and a brochure [1985] about learning opportunities for preschoolers in the school district.

[2]It should be noted that the number of children screened and the participation rate provided in Table 1 were derived in different ways. In Oakwood, the participation rate was estimated by the district's Early Childhood Coordinator. The participation rate for Maplewood was estimated by taking the number of children screened and dividing by the kindergarten enrollment for the same year. In other programs, participation rates were calculated by dividing the number of children screened by the number of children eligible for screening (based on census data).

[3]In the Elmwood program, the term "screening" was also used to denote brief (e.g., one hour) assessment that typically followed PSS screening. For example, a child referred for ECSE assessment may be briefly screened in the speech/language area rather than thoroughly assessed, if no serious problems or concerns in speech/language skills were noted during PSS screening. In this context, screening was defined as "attending to" or observing a developmental area without using standardized assessment tools.

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